Amendments to the Drawings

Attached are sheets replacing all the drawings currently on file. Sheets 1 - 11, containing Figures 1-14 are attached at the Appendix, and replace original sheets 1-14.

The attached sheets include formal drawings for Figures 1-14.

In Figures 1-9, 12 and 14 handwritten reference numerals have been replaced with corresponding typeset reference numerals and extraneous text has been removed.

In Figure 10, the perspective view of the single dielectric block having waveguide arrays connected to orthogonal faces has been replaced with corresponding top (Figure 10A) and side (Figure 10B) views.

In Figure 11, the perspective view of stacked waveguides has been clarified by removing one stack of waveguides and by removing lines showing transparency.

In Figure 13, the perspective view of a connection of attached waveguide arrays using connection blocks has been changed to a side view. Reference numerals 116 and 118, which appear at paragraph 0048 of the application as filed, have been added to identify blocks A and B respectively.

Appendix: Replacement Sheets 1-14.

REMARKS/ARGUMENTS

Claims

Claims 1-15 are pending. Claims 16-28 have been canceled. Claim 8 has been amended to more clearly define the invention.

Claim rejection under 35 U.S.C. § 102(e)

The Examiner rejected claims 1, 3-10, 13 and 14 as being anticipated by U.S. Patent Application Publication No. 2004/0126055 A1 to Flory et al., hereinafter referred to as Flory. Applicant respectfully disagrees for at least the following reasons.

Flory discloses a two-dimensional photonic crystal interferometric switch (30). The switch (30) comprises a two-dimensional photonic crystal slab (31), a series of posts (39) disposed in air [paragraph 0030], an input portion (32), output portions (33, 34) and an interference channel (35). The input and output portions, together with the interference channel, are defined by the absence of posts (39). The switch (30) further comprises a resonator region (38) having a connecting channel (36) defined by a missing post (39) and the presence of posts (24) larger than the posts (39) in the other parts of the switch. Light is input at the input portion (32) and the light intensity at the output of the switch is controlled by tuning the refractive index of the posts (24) in the resonator region (38), the tuning being accomplished by the tuning member (22).

In the invention as claimed in independent claim 1, an optical connector comprises a three-dimensional bulk dielectric material, e.g. prism 112 in Fig. 12, that can be abutted to an input connection face of an input optical component and to an output connection face of an output optical component. The optical connector further comprises a connection path written within the three-dimensional bulk dielectric, the connection path for connecting the input connection face to the output connection face.

There are several major differences between Flory and the invention as claimed in claim 1.

Firstly, in Flory's switch, light is confined to propagate in the x-y plane of Fig. 2. There can be no light propagation in the z-direction and hence the expression *two-dimensional photonic crystal interferometric switch*. In the invention as claimed in claim 1, there is no such

limitation on the propagation of a light signal, other than it propagates in the connection path, hence the expression *three-dimensional optically-transmissive bulk dielectric.*

Secondly, the input and output portions in Flory's switch are defined by the absence of posts (39) and are thus made of air. In the present invention, the connection path is written in the bulk dielectric material. The writing of the connection path is made with a Femtosecond Laser Dielectric Modification (FLDM) process as explained in the description. This FLMD process locally increases the index of refraction of the dielectric material at the focus point. A series of end to end bulk material segments are modified using the FLMD process and a connection path is formed. The connection path has a refractive index higher than that of the surrounding bulk dielectric material thus propagating light in the connection path by a total internal reflection process. By contrast, in Flory, the refractive index of the input and output portions is lower than that of the material surrounding the input and output portions. Additionally, the propagation of light in Flory is governed by the interaction of the propagating light signal with the periodic structure formed by the posts (39, 24), the refractive index of the post and the refractive index of air, not by total internal reflection as in the present invention.

Applicant submits that Flory fails to teach or suggest an optical connector as claimed in claim 1. Flory does not teach or suggest a three-dimensional optically-transmissive bulk dielectric and a connection path written in the three-dimensional bulk dielectric as recited in claim 1. Therefore, withdrawal of the rejection of claim 1 and of its dependent claims 3-10, 13 and 14 under 35 U.S.C. § 102(e) is respectfully requested.

Claim rejection under 35 U.S.C. § 103(a)

The Examiner rejected claims 2, 11, 12 and 15 as being obvious in view of Flory.

Claims 2, 11, 12 and 15 ultimately depend on claim 1, which, Applicant submits, is allowable for at least the reasons given above in response to the anticipation rejection. Since Flory does not teach all the claimed limitations of claim 1, it cannot teach or reasonably suggest all the claimed limitations of a claim dependent from claim 1. Therefore, there is no showing of prima facie obviousness. Withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

In relation to Item 11 of the Examiner's reasons, Applicant wishes to clarify a statement made in a response dated April 10, 2006 to a restriction requirement and quoted by the Examiner in the Office Action of April 18, 2006.

On page 6 of the April 10, 2006 response, at the last paragraph, Applicant stated: "The selection of TIR (total internal reflection) connection or a photonic crystal structure does not result in independent or distinct inventions, since both structures are well-known equivalents for providing a bent waveguide while limiting bending losses at the turn." This is true for waveguides in a bulk material only.

Total internal reflection occurs at the interface between materials having different refractive indices. When light propagating in the material having a high refractive index arrives (with a proper angle) at the material having the low refractive index, it is totally reflected in the material having the high refractive index. TIR does not apply to devices where the transmission of light is based on the propagation of optical waves in a periodic or quasi-period structure such as disclosed by Flory. In such devices it would simply be impossible to implement TIR.

No fee is believed due for this submission. However, Applicant authorizes the Commissioner to debit any required fee from Deposit Account No. 501593. The Commissioner is further authorized to debit an additional amount required, and to credit any overpayment to the above noted deposit account.

It is submitted that this application is now in condition for allowance, and action to that end is respectfully requested.

Respectfully submitted,
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